

ABSTRACT OF THE DISCLOSURE

The present invention discloses a Gram negative bacterium in which the expression of a protein involved in LPS transport to the outer membrane is functionally downregulated such that the level of LPS in the outer membrane is decreased compared to a wild-type Gram negative bacterium. Down regulation of Imp and MsbA proteins can result in such a bacterium. Outer membrane vesicle preparations derived from the Gram negative bacterium of the invention can be used in vaccines to provide protection against bacterial infection.